

ZX5T869G

25V NPN LOW SATURATION TRANSISTOR IN SOT223

SUMMARY

$BV_{CEO} = 25V$; $R_{SAT} = 27m\Omega$; $I_C = 7A$

DESCRIPTION

Packaged in the SOT223 outline this new 5th generation low saturation 25V NPN transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.



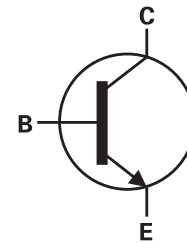
SOT223

FEATURES

- Extremely low equivalent on-resistance; $R_{SAT} = 27m\Omega$ at 6.5A
- 7 amps continuous current
- Up to 20 amps peak current
- Very low saturation voltages
- Excellent h_{FE} characteristics up to 20 amps

APPLICATIONS

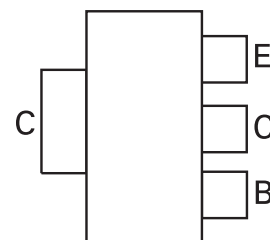
- DC - DC converters
- MOSFET gate drivers
- Charging circuits
- Power switches
- Motor control



ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZX5T869GTA	7"	12mm embossed	1000 units
ZX5T869GTC	13"	12mm embossed	4000 units

PINOUT



TOP VIEW

DEVICE MARKING

- X5T869

ZX5T869G

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-base voltage	BV_{CBO}	60	V
Collector-emitter voltage	BV_{CEO}	25	V
Emitter-base voltage	BV_{EBO}	7.5	V
Continuous collector current	I_C	7	A
Peak pulse current	I_{CM}	20	A
Power dissipation at $T_A = 25^\circ\text{C}$ ^(a)	P_D	3.0	W
Linear derating factor		24	mW/°C
Power dissipation at $T_A = 25^\circ\text{C}$ ^(b)	P_D	1.6	W
Linear derating factor		12.8	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	°C

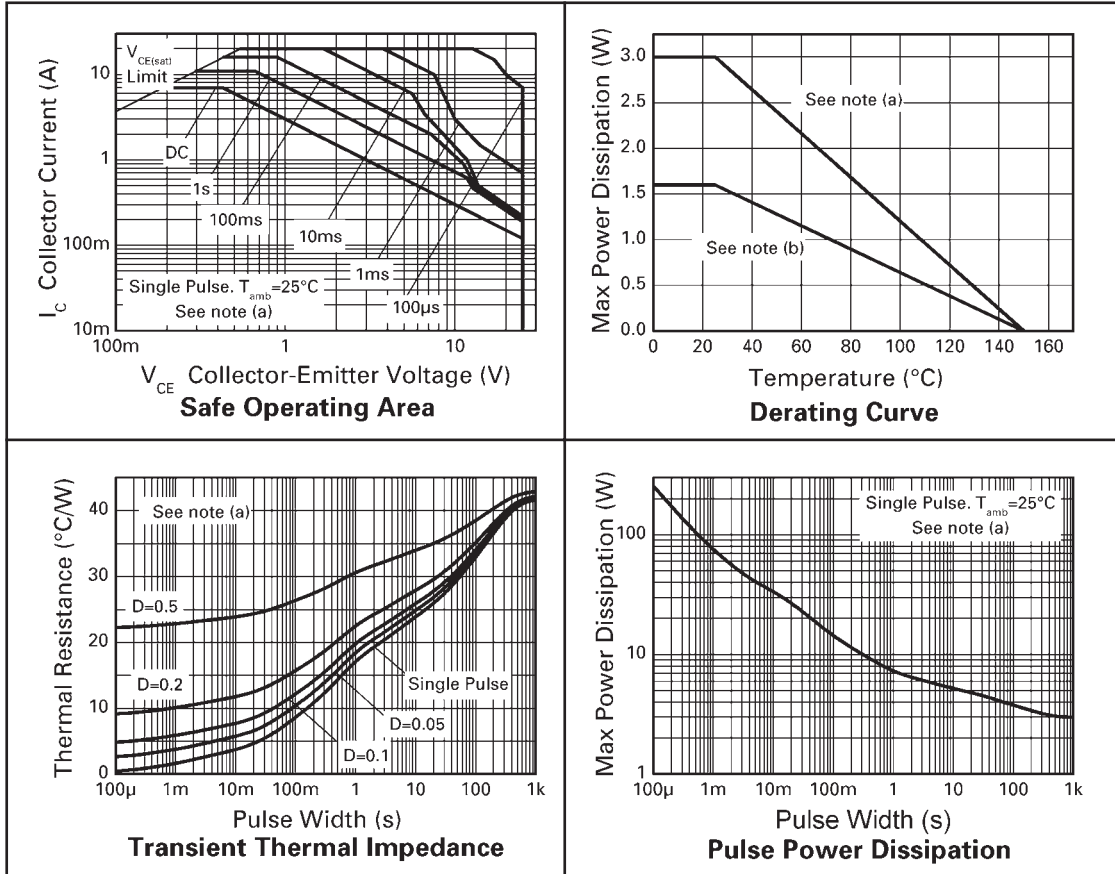
THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient ^(a)	$R_{\theta JA}$	42	°C/W
Junction to ambient ^(b)	$R_{\theta JA}$	78	°C/W

NOTES

- (a) For a device surface mounted on 52mm x 52mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.
(b) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

CHARACTERISTICS



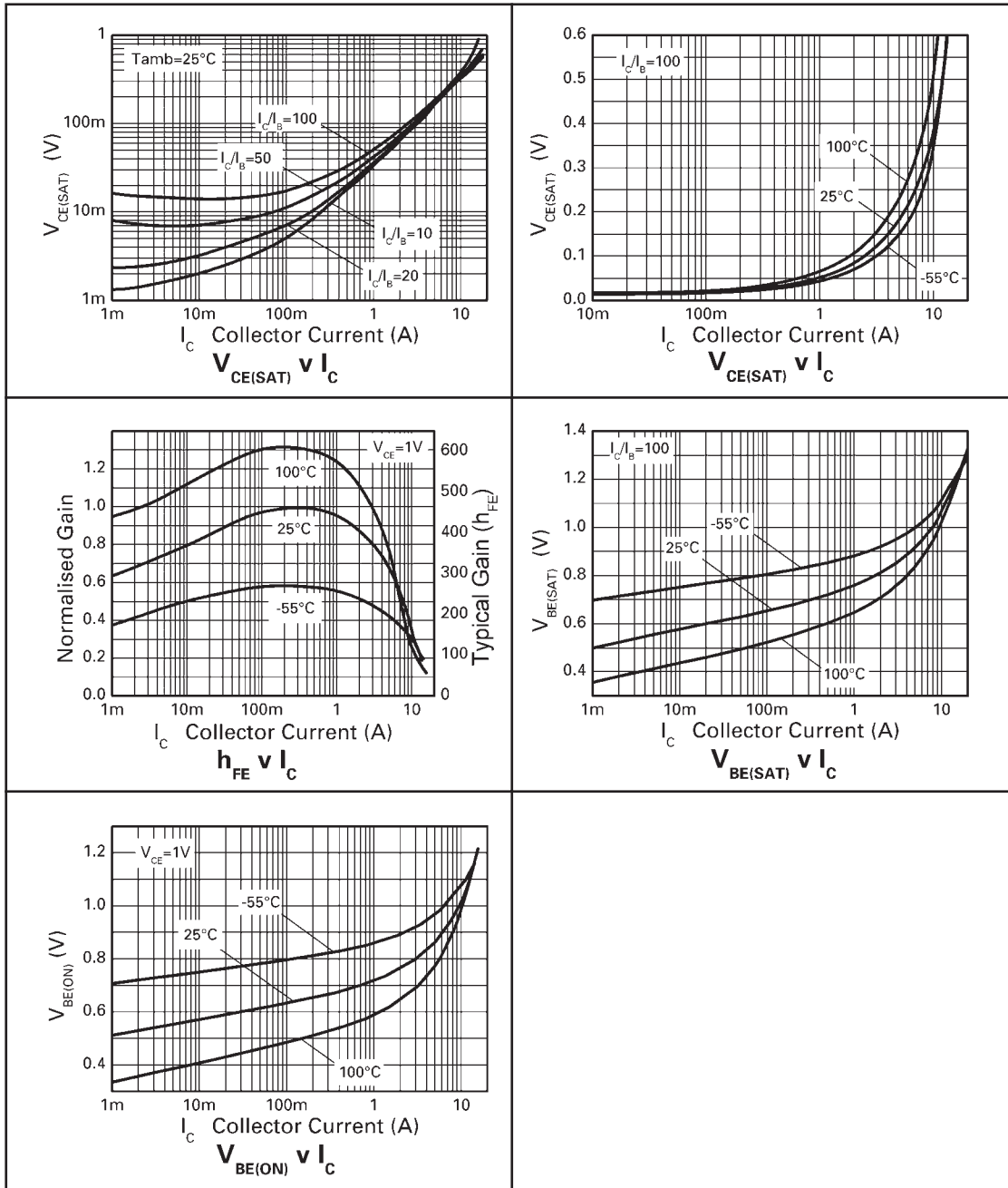
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ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-base breakdown voltage	BV_{CBO}	60	105		V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CER}	60	105		V	$I_C = 1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-emitter breakdown voltage	BV_{CEO}	25	35		V	$I_C = 10\text{mA}^*$
Emitter-base breakdown voltage	BV_{EBO}	7.5	8.2		V	$I_E = 100\mu\text{A}$
Collector cut-off current	I_{CBO}			20 0.5	nA μA	$V_{CB} = 50\text{V}$ $V_{CB} = 50\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Collector cut-off current	I_{CER} $R \leq 1\text{k}\Omega$			20 0.5	nA μA	$V_{CB} = 50\text{V}$ $V_{CB} = 50\text{V}$, $T_{amb} = 100^{\circ}\text{C}$
Emitter cut-off current	I_{EBO}			10	nA	$V_{EB} = 6\text{V}$
Collector-emitter saturation voltage	$V_{CE(SAT)}$		26 51 98 173	40 65 80 150 220	mV mV mV mV mV	$I_C = 500\text{mA}$, $I_B = 10\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 100\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 10\text{mA}^*$ $I_C = 2\text{A}$, $I_B = 10\text{mA}^*$ $I_C = 6.5\text{A}$, $I_B = 150\text{mA}^*$
Base-emitter saturation voltage	$V_{BE(SAT)}$		1010	1080	mV	$I_C = 6.5\text{A}$, $I_B = 150\text{mA}^*$
Base-emitter turn-on voltage	$V_{BE(ON)}$		885	980	mV	$I_C = 6.5\text{A}$, $V_{CE} = 1\text{V}^*$
Static forward current transfer ratio	h_{FE}	300 300 200 40	400 450 300 90			$I_C = 10\text{mA}$, $V_{CE} = 1\text{V}^*$ $I_C = 1\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 7\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 20\text{A}$, $V_{CE} = 1\text{V}^*$
Transition frequency	f_T		150			$I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Output capacitance	C_{OBO}		48		pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}^*$
Switching times	t_{ON} t_{OFF}		33 464		ns	$I_C = 1\text{A}$, $V_{CC} = 10\text{V}$, $I_{B1} = -I_{B2} = 100\text{mA}$

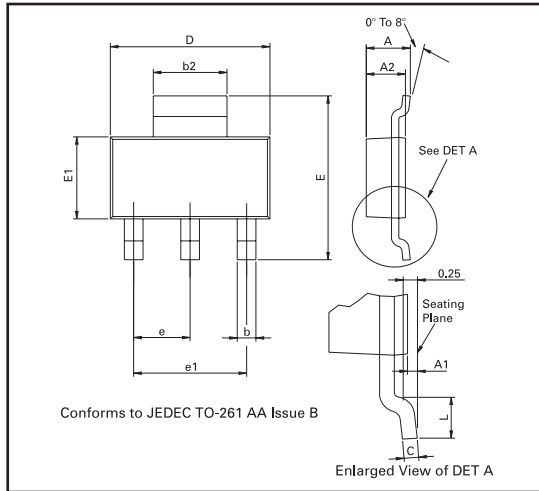
* Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

TYPICAL CHARACTERISTICS

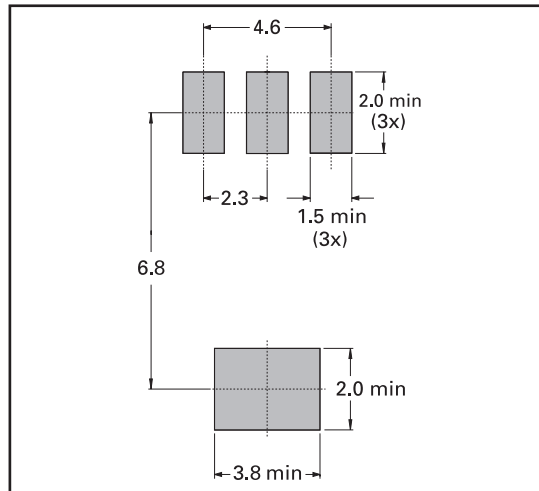


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PACKAGE OUTLINE



PAD LAYOUT DETAILS



Controlling dimensions are in millimeters. Approximate conversions are given in inches

PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	-	1.80	-	0.071	e	2.30 BSC		0.0905 BSC	
A1	0.02	0.10	0.0008	0.004	e1	4.60 BSC		0.181 BSC	
b	0.66	0.84	0.026	0.033	E	6.70	7.30	0.264	0.287
b2	2.90	3.10	0.114	0.122	E1	3.30	3.70	0.130	0.146
C	0.23	0.33	0.009	0.013	L	0.90	-	0.355	-
D	6.30	6.70	0.248	0.264	-	-	-	-	-

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